

The Central Technical Support Facility (CTSF) — Meeting Warfighters' System Integration and Interoperability Needs

MAJ Shawn Murray

Today's warfighters trust when they start their vehicles or set up tactical operations centers that the command, control, communications, computers, and intelligence (C4I) systems inside will interoperate with each other. Full interoperability of military systems is critical to America's success in the global war on terrorism (GWOT) and future wars, and CTSF's job is ensuring net-centric system interoperability.

Full interoperability of military systems is critical to America's success in GWOT and future wars. Here, LTC Jeffrey A. Sorenson, Army CIO/G-6, listens as LTC John Kolasheski, 3rd Heavy Brigade Combat Team, 3rd Infantry Division, briefs him on his unit's communications operations at Patrol Base Assassin, Iraq. (U.S. Army photo by SPC Emily J. Wilsoncroft.)

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CTSF is the Army's strategic facility responsible for interoperability engineering, executing Army Interoperability Certification (AIC) testing, maintaining configuration control for all operational- through tactical-level information technology/national security systems, and supporting deployed warfighters' digital needs.

Located at Fort Hood, TX, CTSF was organized in 1996 by Program Executive Office (PEO) Command, Control, and Computer Systems (now PEO Command, Control, and Communications Tactical). CTSF was originally designed to provide a location

for rapid integration, testing, and deployment of the Army Battle Command System (ABCS), which digitizes the Army's battle command and control capability. As the Army's warfighting capability digitization evolves, CTSF's mission has expanded to integrate and test more than 200 net-centric systems. This number is expected to grow as more and more Army systems become network enabled.

Accomplishing Interoperability

On July 9, 2007, CTSF was reorganized under the U.S. Army Materiel Command's Communications-Electronics Life Cycle Management Command, and

employs approximately 200 government, military, and civilian workers. It provides facilities for more than 400 additional government and civilian workers from several PEOs in a teaming environment, accomplishing Army interoperability integration and certification.

The CTSF campus covers more than 264,000 square feet with more than 40,000 square feet dedicated for software integration and AIC testing. Because of its reconfigurable design, the integration and test facility can support a wide range of tactical network architectures (many simultaneous)



The CTSF SE&I department supports engineering assessments on new and developing C4I products. Here, Army civilian Paul Vanluvender, an electronics integrated systems mechanic in the Command, Control, and Computers Avionics Directorate, performs operational verification of electronics systems on a Mine Resistant Ambush Protected vehicle in Southwest Asia in March 2008. (U.S. Army photo by Steve Grzedzinski.)

from individual vehicles all the way to theater level. The CTSF test environment's flexibility and scalability is not available anywhere else in the world.

According to CTSF Director COL Steven Drake, CTSF's mission "is to provide a unique, innovative, and scalable environment, with skilled and dedicated personnel, using qualified synergistic processes to support DOD's net-enabled strategic vision." Drake says the mission is accomplished by "executing configuration management, systems engineering support, and certification testing for Army and joint C4I providers."

As the Army continues to develop new net-centric capabilities, the CTSF stands ready to integrate and test C4I products for interoperability. The CTSF's vision is to become a customer-valued organization ensuring that the best net-centric C4I capabilities are available to U.S. Army, Joint, and coalition warfighters.

AIC Testing

AIC is a part of developmental testing that occurs before a Milestone C

decision. It gives the Army Staff; the Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology personnel; and the warfighter confidence that the fielded

equipment is interoperable and integrated with the other systems on their tactical network. CTSF AIC testing immerses the System Under Test (SUT) in a holistic tactical environment to determine interoperability with other networked systems. Certification testing is done on behalf of the Army Chief Information Officer (CIO)/G-6 to meet the *Title 40* responsibilities, which mandate that any system, application, or hardware will not be used on the Army's tactical network until they have

been tested and certified by the CIO/G-6.

To accomplish its mission, the CTSF Technical Division has three main departments that provide the system integration and interoperability needed by today's warfighters: Configuration Management (CM), Systems Engineering and Integration (SE&I), and Test. These departments synergistically conduct AIC testing, providing the warfighting community the best tested tactical hardware/software possible.

The CM staff not only ensures CM for the AIC test floor, but also the configuration control of the Army's fielded software baseline. Each year, the CM department produces more than 250,000 CDs and DVDs of approved baseline software to ensure that only approved software is used by our Soldiers in the field. The CM department also maintains a geospatial digital map library that is used by Army



Ensuring net-centric system interoperability is the CTSF's job. Here, employees Matthew Garcia, Donna Bryant, and Patricia Price set up the test floor for a systems integration test at CTSF, Fort Hood. (U.S. Army photo by David Landmann.)



CTSF employees provide unparalleled, uncompromised, consistent, and responsive support to the warfighter. Here, Harold Nuessen and Leslie Hinchman review test documentation in preparation for a systems intelligence test at CTSF, Fort Hood. (U.S. Army photo by David Landmann.)

tactical computer systems, ABCS data products, and approved baseline software, which ensures that every map in these tactical systems is the most accurate available.

The SE&I department provides direct technical support to test and certification activities as well as to software developers. Not only do department engineers verify that new software and data products are compliant, but they also provide network engineering for Army training and unit deployments.

Additionally, the SE&I department supports engineering assessments on new and developing C4I products. These assessments, conducted in the CTSF's realistic tactical architectures, allow developers to test engineering releases of products in a non-attribution environment. The SE&I information assurance (IA) branch works with all sections to provide an IA assessment during formal AIC baseline tests, as well as IA and vulnerability assessment

patch testing to update fielded software.

The CTSF Test department provides Army and Joint AIC testing. Staffed with test officers, operators, operations research analysts, and technical writers, the Test department offers the Army the expertise and experience necessary to conduct the most complex interoperability software testing available in DOD today.

Interoperability requirements used for AIC testing come from the U.S. Army Training and Doctrine Command's Capabilities Managers (TCMs),

PEOs, and formal requirements documents. From these requirements, program managers (PMs) and TCMs develop mission threads that describe the information flow through a multi-echelon architecture. The Test department uses these mission threads to create test cases that embrace an end-to-end approach to look at the cause and effect of information flow through a system in a networked environment. As part of the overall test process, CTSF implemented a rigorous test-fix-test process that provides the PMs and test officers time to prove out software interoperability, as well as the mission threads before formal AIC testing. This methodical, measured approach to testing maintains configuration control, yet allows software fixes and additional software drops to facilitate developing interoperable functional code more quickly.

As the Army conducts more of its operations in a Joint environment, CTSF will provide testing to meet the Joint

staff's mandate for Joint Technical Architecture (JTA) compliance. Many of the current mission threads either start or end in the Joint arena.

Sharing Data and Test Resources

To avoid complementary testing redundancy, the CTSF has a formal Memorandum of Understanding (MOU) with the Joint Interoperability Test Command (JITC) that permits the sharing of data and test resources between the two organizations. This allows Army systems to meet JTA compliance without duplicating effort. As part of this MOU, the CTSF has added JITC liaisons to better integrate communities.

The Army's investment in CTSF to ensure interoperability for warfighters has become a shining success and a beacon for DOD in developing interoperability across all services and warfighting domains. While much work has yet to be done to achieve the DOD vision, the Army's CTSF is ready to be an integral part in accomplishing this goal. With its vast experience and dedicated workforce, the CTSF is meeting AIC integration challenges and has the resources to ensure Army interoperability in a Joint environment. CTSF is the Army's only facility to test theater-level system-of-systems products in a net-centric environment, and its employees provide unparalleled, uncompromised, consistent, and responsive support to the warfighter.

MAJ SHAWN MURRAY is the CTSF's Deputy Technical Director. He holds a B.S.S. in educational military history from Ohio University. His military education includes the Infantry Officer Basic Course, Armor Officer Advance Course, and the Army Acquisition Basic Course. Murray is an Army Acquisition Corps member and is Level III certified in test and evaluation.